fx-95MS fx-500MS User's Guide

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EEE Yönetmeliğine Uygundur



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1. Important Information

- The displays and illustrations (such as key markings) shown in this User's Guide are for illustrative purposes only, and may differ somewhat from the actual items they represent. The contents of this manual are subject to change without notice.
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- · Be sure to keep all user documentation handy for future reference.

2. Sample Operations

Sample operations in this manual are indicated by a $\mathcal D$ icon. Unless specifically stated, all sample operations assume that the calculator is in its initial default setup.

3. Initializing the Calculator

Perform the following procedure when you want to initialize the calculator and return the calculation mode and setup to their initial default settings. Note that this operation also clears all data currently in calculator memory.

ON SHIFT MODE (CLR) 3 (AII)

4. Safety Precautions



- Keep batteries out of the reach of small children.
- Use only the type of battery specified for this calculator in this manual.

5. Handling Precautions

- · Dim figures on the display of the calculator indicate that battery power is low. Continued use of the calculator when the battery is low can result in improper operation. Replace the battery as soon as possible when display figures becomes dim. Even if the calculator is operating normally, replace the battery at least once every two years. A dead battery can leak, causing damage to and malfunction of the calculator. Never leave a dead battery in the calculator.
- . The battery that comes with the calculator discharges slightly during shipment and storage. Because of this, it may require replacement sooner than the normal expected battery life.
- · Do not use an oxyride battery* or any other type of nickel-based primary battery with this product. Incompatibility between such batteries and product specifications can result in shorter battery life and product malfunction.
- · Avoid use and storage of the calculator in areas subjected to temperature extremes, and large amounts of humidity and dust.
- · Do not subject the calculator to excessive impact, pressure, or bending.
- Never try to take the calculator apart.
- · Use a soft, dry cloth to clean the exterior of the calculator.
- · Whenever discarding the calculator or batteries, be sure to do so in accordance with the laws and regulations in your particular area.
- Company and product names used in this manual may be registered trademarks or trademarks of their respective owners.

6. Removing the Hard Case

Before using the calculator, slide its hard case downwards to remove it, and then affix the hard case to the back of the calculator as shown in the illustration nearby.



7. Turning Power On and Off

Press (IN) to turn on the calculator.

Press SHIFT AC (OFF) to turn off the calculator.

Auto Power Off

Your calculator will turn off automatically if you do not perform any operation for about 10 minutes

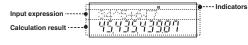
8. Adjusting Display Contrast

- 1. Press the MODE key a number of times until you reach the setup screen shown to the riaht.
- 2. Press 2.
- 3. Use and to adjust contrast.
- 4. After the setting is the way you want, press AC.

Important: If adjusting display contrast does not improve display readability, it probably means that battery power is low. Replace the battery.

9. Reading the Display

The display of the calculator shows expressions you input, calculation results, and various indicators.



10. Specifying the Calculation Mode

Perform this key operation:
MODE 1 (COMP)
MODE 2 (SD)
MODE 3 (REG)
MODE MODE 1 (EQN)

Note: • The initial default calculation mode is the COMP Mode. • Mode indicators appear in the upper part of the display. Be sure to check the current calculation mode (COMP, SD, REG) and angle unit setting (Deg, Rad, Gra) before beginning a calculation.

11. Configuring the Calculator Setup

Pressing the lione key more than once displays additional setup screens. Underlined (____) settings are initial defaults

1 Deg 2 Rad 3 Gra Specifies degrees, radians or grads as the angle unit for value input and calculation result display.

Disp **∢**CONT►

Note: In this manual, the Deg symbol next to a sample operation indicates degrees.

1 Fix 2 Sci 3 Norm Specifies the number of digits for display of a calculation

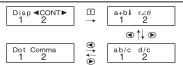
Fix Sci Norm

Fix: The value you specify (from 0 to 9) controls the number of decimal places for displayed calculation results. Calculation results are rounded off to the specified digit before being displayed. Example: $100 \div 7 = 14.286$ (Fix 3)

Sci: The value you specify (from 1 to 10) controls the number of significant digits for displayed calculation results. Calculation results are rounded off to the specified digit before being displayed. Example: $1 \div 7 = 1.4286 \times 10^{-1}$ (Sci 5)

Norm: Selecting one of the two available settings (Norm 1, Norm 2) determines the range in which results will be displayed in nonexponential format. Outside the specified range, results are displayed using exponential format.

Norm 1: $10^{-2} > |x|$, $|x| \ge 10^{10}$ Norm 2: $10^{-9} > |x|$, $|x| \ge 10^{10}$ Example: $1 \div 200 = 5 \times 10^{-3}$ (Norm 1): 0.005 (Norm 2)



coordinates (a+bi) or polar coordinates (r/θ) for EQN Mode solutions. The "r $\angle\theta$ " indicator is displayed while polar coordinates $(r \angle \theta)$ are selected.

1 ab/c 2 d/c Specifies either mixed fraction (ab/c) or improper fraction (d/c) for display of fractions in calculation results.

1 Dot 2 Comma Specifies whether to display a dot or a comma for the calculation result decimal point. A dot is always displayed during input.

Dot: Period decimal point, comma separator Comma: Comma decimal point, period separator

■ Initializing Calculation Mode and Setup

To return the calculation mode and setup to the initial defaults shown below, press ON SHIFT MODE (CLR) 2 (Mode) =.

Angle Unit: Deg

Exponential Display Format: Norm 1

Fraction Display Format: a b/c Decimal Point Character: Dot

12. Inputting Expressions and Values

 $4 \times \sin 30 \times (30 + 10 \times 3) = 120$ Deg 4×sin 30×(30 120. 4 🕱 sin 30 🕱 (30 🛨 10 🕱 3) 🖃

Note: • The memory area used for calculation input can hold 79 "steps". One step is taken up each time you press a number key or arithmetic operator key (+, -, X, +). A SHFT or ALPHA key operation does not take up a step, so inputting x^3 (3 $\sqrt{}$ example, takes up only one step. • Whenever you input the 73rd step of any calculation, the cursor changes from " " to " to let you know memory is running low.

■ Calculation Priority Sequence

When the priority of two expressions is the same, the calculation is performed from left to right.

1st	Function with parentheses: $Pol(x, y)$, $Rec(r, \theta)$		
2nd	Type A functions: With these functions, the value is entered and then the function key is pressed. $(x^3, x^2, x^{-1}, x!, \circ ``", \hat{x}, \hat{x}_1, \hat{x}_2, \hat{y}, \circ, ``, ")$		
3rd	Powers and roots: ^(x ^y), ^x √		
4th	Fractions		
5th	Implied multiplication of π , e (natural logarithm base), memory name, or variable name: 2π , $3e$, $5A$, πA , etc.		
6th	Type B functions: With these functions, the function key is pressed and then the value is entered. ($\sqrt{}$, $\sqrt{}$, \log , \ln , e^x , 10^x , \sin , \cos , \tan , \sin -1, \cos -1, \tan -1, \sin h, \cosh -1, \tanh -1, $(-)$)		
7th	Implied multiplication of Type B functions: $2\sqrt{3}$, Alog2, etc.		
8th	Permutation (nPr), combination (nCr)		
9th	Multiplication, division (×, ÷)		
10th	Addition, subtraction (+, -)		
• The	• The negative sign (-) is treated as a Type B function, so particula		

care is required when the calculation includes a high-priority Type A function, or power or root operations. Example: $(-2)^4 = 16$: $-2^4 = -16$

■ Making Corrections During Input

- Use <a> and <a> to move the cursor to the location you want. • Press El to delete the number or function at the current cursor position.
- Press SHIFT DEL (INS) to change to an insert cursor [3]. Inputting something while the insert cursor is on the display inserts the input at the insert cursor position.
- Pressing SHFT (INS), or = returns to the normal cursor from the

13. Basic Calculations

■ Fraction Calculations

2 @ 3 ★ 1 @ 2 = 1_1_6.

Note: • Mixing fractions and decimal values in a calculation will cause the result to be displayed as a decimal value. • Fractions in calculation results are displayed after being reduced to their lowest terms

To switch a calculation result between improper fraction and mixed fraction format: Press SHIFT @ (d/c). To switch a calculation result between fraction and decimal

format: Press @

■ Percent Calculations

30.	150 X 20 SHIFT (%)	150 × 20% = 30
	t percentage of 880 is 660. (75%)	Calculate what per
75.	660 ÷ 880 \$HFT ≡ (%)	
	by 15%. (2875)	Increase 2500 by
2875.	2500 🗶 15 🖽 🖃 (%) 🛨	
	by 25%. (2625)	Discount 3500 by
2625.	3500 🗶 25 SHIFT 🖃 (%) 🖃	
	um of 168, 98, and 734 by 20%. (800)	Discount the sum
	734 ■ Ans SHIFT RCL (STO) (→) (A)	
800.	<u>ALPHA</u> (→) (A)* X 20 SHIFT (%) (—	A

* As shown here, if you want to use the current Ans (answer) memory value in a mark up or discount calculation, you need to assign the Ans memory value into a variable and then use the variable in the mark up/discount calculation.

300 grams are added to a test sample originally weighing 500 grams, producing a final test sample of 800 grams. What percent of 500 grams is 800 grams? (160%) 300 + 500 SHIFT = (%) 160.

What is the percentage change when a value is increased from 40 to 46? (15%)

46 - 40 SHIFT = (%)

15.

■ Degree, Minute, Second (Sexagesimal) Calculations

The following is the input format for a sexagesimal value: {degrees} [Final {minutes} [Final {seconds} [Final

Note: You must always input something for the degrees and minutes, even if they are zero

2°20′30″ + 39′30″ = 3°00′00′ 2 = 20 = 30 = 10

Convert 2°15′18" to its decimal equivalent. 2 •• 15 •• 18 •• = •• 2.255 (Converts decimal to sexagesimal.) SHIFT $\bullet \bullet \bullet$ (\leftarrow) 2°15°18.

■ Multi-Statements

You can use the colon character (:) to connect two or more expressions and execute them in sequence from left to right when you press =.

/ 3 + 3 : 3 × 3 3 + 3 ALPHA Pol((:)3 × 3 = 6.Disp 9.

■ Using Engineering Notation

A simple key operation transforms a displayed value to engineering notation

Transform the value 1234 to engineering notation, shifting the decimal point to the right. 1234 ENG 1.234×103 ENG 1234.×10°

■ Calculation History

In the COMP Mode, the calculator remembers up to approximately 150 bytes of data for the newest calculation. You can scroll through calculation history contents using (a) and (v)

Note: Calculation history data is all cleared whenever you press [0]] when you change to a different calculation mode, or whenever you initialize modes and settings.

■ Replay

While a calculation result is on the display, you can press
or to edit the expression you used for the previous calculation

 $4 \times 3 + 2.5 = 14.5$ 14.5 4 **X** 3 **+** 2.5 **=** $4 \times 3 - 7.1 = 4.9$ (Continuing) ◀ ŒL ŒL ŒL Œ 7.1 ≡ 4.9

■ Answer Memory (Ans)

The last calculation result obtained is stored in Ans (answer) memory. Ans memory contents are updated whenever a new calculation result is displayed. In addition to , Ans memory contents are also updated with result whenever you press SHIFT (%), M+, SHIFT M+ (M-), or SHIFT RCL (STO) followed by a letter (A through F, or M, X, or Y).

 \nearrow To divide the result of 3×4 by 30 3 🗶 4 🖃 Ans÷30 0.4 **1**23 + 456 = <u>579</u> 579. 123 🗐 456 🗐 789 - 579 = 210(Continuing) 789 - Ans = 210.

■ Variables (A, B, C, D, E, F, X, Y)

Your calculator has eight preset variables named A, B, C, D, E, F, X. and Y.

To assign the result of 3 + 5 to variable A 8. 3 + 5 SHIFT RCL (STO) (-) (A) To multiply the contents of variable A by 10 80. (Continuing) APHA ← (A) X 10 = To recall the contents of variable A (Continuing) RCL (-)(A) 8. To clear the contents of variable A

■ Independent Memory (M)

You can add calculation results to or subtract results from independent memory. The "M" appears on the display when there is any value other than zero stored in independent memory.

0 [SHIFT] [RCL] (STO) (--) (A)

0.

0.

To clear the contents of M O SHIFT RCL (STO) M+ (M) \nearrow To add the result of 10×5 to M (Continuing) 10 X 5 M+ To subtract the result of 10 + 5 from M 15. (Continuing) 10 + 5 SHFT M+ (M-)

35.

(Continuing) RCL M+ (M) Note: Variable M is used for independent memory.

■ Clearing the Contents of All Memories

Independent memory and variable contents are retained even if you press AC, change the calculation mode, or turn off the calculator. Perform the following procedure when you want to clear the contents of all memories

ON SHIFT MODE (CLR) 1 (McI)

To recall the contents of M

14. Function Calculations

 π : π is displayed as 3.141592654, but π = 3.14159265358980 is used for internal calculations

e: e is displayed as 2.718281828, but e = 2.71828182845904 is used for internal calculations.

sin, cos, tan, sin-1, cos-1, tan-1: Trigonometric functions. Specify the angle unit before performing calculations. See <u>1</u>.

sinh, cosh, tanh, sinh-1, cosh-1, tanh-1: Hyperbolic functions. The angle unit setting does not affect calculations. See \(\biggreat{\mathbb{Z}}{2} \).

o, r, g: These functions specify the angle unit. o specifies degrees, radians, and ⁹ grads. Input a function from the menu that appears when you perform the following key operation: SHIFT Ans (DRG►). See <u>// 3</u>.

10°, e^x : Exponential functions. See $\underline{\mathcal{Q}_4}$.

log: Logarithmic function. See \$\int_5\$. In: Natural logarithm to base e. See \mathcal{Q}_6 .

 x^2 , x^3 , (x^y) , $\sqrt{}$, $\sqrt{}$, $\sqrt{}$, $\sqrt{}$, x^{-1} : Powers, power roots, and reciprocals. See 17

Pol, Rec: Pol converts rectangular coordinates to polar coordinates, while Rec converts polar coordinates to rectangular coordinates. See <u>/8</u>. Specify the angle unit

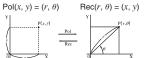
before performing

Calculation result θ is

displayed in the range

of $-180^{\circ} < \theta \le 180^{\circ}$

calculations.



Rectangular Coordinates (Rec) Coordinates (Pol)

x!: Factorial function. See \mathbb{Z}_9 . Ran#: Generates a 3-digit pseudo random number that is less than 1. See <u>\$\mathcal{D}_{10}\$</u>.

nPr, nCr: Permutation (nPr) and combination (nCr) functions. See Rnd: The argument of this function is made a decimal value and then rounded in accordance with the current number of display digits

rounded off to 10 digits. See <u>\$\int_{12}\$</u>. Note: Using functions can slow down a calculation, which may delay display of the result. To interrupt an ongoing calculation before its result appears, press AC

setting (Norm, Fix, or Sci). With Norm 1 or Norm 2, the argument is

■ Examples

1 sin 30°= 0.5 **D**eg 0.5 sin 30 = sin⁻¹0.5 = 30° Deg 30. SHIFT $\sin (\sin^{-1}) 0.5$ hyp sin (sinh) 1 = 1.175201194 **2** sinh 1 = 1.175201194 $cosh^{-1} 1 = 0$ 0. hyp SHIFT cos (cosh-1) 1 **3** $\pi/2$ radians = 90°, 50 grads = 45° **Deg**

(SHIFT EXP (π) \div 2) SHIFT Ans $(DRG \triangleright)$ 2 (R)50 SHIFT Ans (DRG►) 3 (G) = **94** To calculate $e^5 \times 2$ to three significant digits (Sci 3)

MODE ---- 2 (Sci) 3 SHFT In (e^x) 5 **X** 2 **E** 2.97×10²

5 log 1000 = 3 log 1000 = To calculate In 90 (= log_e 90) to three significant digits (Sci 3)

MODE ---- 2 (Sci) 3 in 90 **≡ 4.50×10**° 7 1.2 × 10³ = 1200 1.2 **X** 10 **x**³ **=** 1200.

 $(-5^2)^3 = -15625$ ((□5x²) ∧3≡ -15625. √32 = 2 $5 \text{ SHFT } \wedge (^x \sqrt{}) 32 \equiv$ 2. To calculate $\sqrt{2} \times 3$ (= $3\sqrt{2}$ = 4.242640687...) to three

decimal places (Fix 3) MODE ---- 1 (Fix) 3

90

45.

4.243

√2**×**3**=**



Pol(\(\frac{1}{2} \) \(\frac{1}{2} \) \(\frac{1}{2} \) r = 2. RCL tan(F) $\theta = 45$.

 \bullet Press RCL ${\rm cos}\,({\rm E})$ to display the value of r, or RCL ${\rm tan}\,({\rm F})$ to display the value of θ

To convert polar coordinates ($\sqrt{2}$, 45°) to rectangular

coordinates Deg

SHIFT Pol() (Rec() 2 9 45 = x = 1.y = 1.RCL (En)

• Press \mathbb{RCL} \mathbb{Cos} (E) to display the value of x, or \mathbb{RCL} \mathbb{tan} (F) to

9 (5+3)! = 40320 (5 + 3) SHFT $x^*(x!)$

10 To obtain two random three-digit integers

459. 1000 SHIFT • (Ran#) = 48. (Actual results will differ.)

11 To determine the number of permutations and combinations possible when selecting four people from a group of 10 Permutations: 10 SHFT (nPr) 4 5040.

Combinations: 10 (rCr) 4 (= 12 To perform the following calculations when Fix 3 is selected

for the number of display digits: $10 \div 3 \times 3$ and Rnd($10 \div 3$) $\times 3$ MODE ---- 1 (Fix) 3 10 **÷** 3 **X** 3 **≡** 10 ÷ 3 = SHFT 0 (Rnd) **X** 3 = 9.999

15. Statistical Calculations (SD, REG)

To coloct this time of statistical coloulation.	Perform this
To select this type of statistical calculation: (Regression formula shown in parentheses)	key operation:
Single-variable (X)	MODE 2 (SD)
Paired-variable (X, Y), linear regression $(y = A + Bx)$	MODE 3 (REG) 1 (Lin)
Paired-variable (X, Y), logarithmic regression $(y = A + Blnx)$	MODE 3 (REG) 2 (Log)
Paired-variable (X, Y), e exponential regression $(y = Ae^{Bx})$	MODE 3 (REG) 3 (Exp)
Paired-variable (X, Y), power regression $(y = Ax^{B})$	MODE 3 (REG) ▶ 1 (Pwr)
Paired-variable (X, Y), inverse regression $(y = A + B/x)$	MODE 3 (REG) ▶ 2 (Inv)
Paired-variable (X, Y), quadratic regression $(y = A + Bx + Cx^2)$	MODE 3 (REG) ▶ 3 (Quad)

■ Inputting Data

- In the SD Mode and REG Mode, the III key operates as the IT
- Always start data input with SHFT MODE (CLR) 1 (ScI) = to clear statistical memory
- Input data using the key sequence shown below. SD Mode: <x-data> DT
- REG Mode: <x-data> <y-data> DT
- DT DT inputs the same data twice.
- · You can also input multiple entries of the same data using

■ Data Input Precautions

- While inputting data or after inputting data is complete, you can use the (A) and (V) keys to scroll through data you have input. If you input multiple entries of the same data using [SHIFT] (;) to specify the data frequency (number of data items) as described above, scrolling through data shows both the data item and a separate screen for the data frequency (Freq).
- Input the new value and then press the 🖃 key to replace the old value with the new one. This also means that if you want to perform some other operation, you should always press the $\overline{\mbox{AC}}$ key first to exit data display
- Pressing the DT key instead of after changing a value on the display registers the value you input as a new data item, and leaves the old value as it is.
- SHFT M+ (CL). Deleting a data value causes all values following it to
- The message "Data Full" appears and you will not be able to input any more data if there is no memory left for data storage. If this happens, press the key to display the screen shown below. Press 2 to exit data input without registering EditOFF ESC

the value you just input.

Press 1 if you want to register the value you just input. If you do this, however, you will not be able to display or edit any of the data you have input.

 After inputting statistical data in the SD Mode or REG Mode, you will be unable to display or edit individual data items any longer after perform either the following operations: changing to another mode; changing the regression type.

- Entering the REG Mode and selecting a regression type (Lin, Log, Exp, Pwr, Inv, Quad) clear variables A through F, X, and Y.
 - . Do not use variables A through F, X, or Y to store data when performing statistical calculations

■ Obtaining Statistical Values from Input Data

Supported statistical variables and the keys you should press to recall them are shown below. For single-variable statistical calculations, the variables marked with an asterisk (*) are available.

Sum: $\Sigma x^{2\star}$, Σx^{\star} , Σy^{2} , Σy , Σxy , Σx^{3} , $\Sigma x^{2}y$, Σx^{4} , Number of Items: n^{\star} . SHIP 1 (S-SUM) 1 to 3 . SHIP 1 (S-SUM) ▶ 1 to 3

. SHIFT 1 (S-SUM) (1 to 3 (Quadratic Σx^3 , $\Sigma x^2 y$, Σx^4 Regression only) Mean: \bar{x}^* , \bar{y} , Population Standard Deviation: σ_{x}^* , σ_{y} , Sample

Standard Deviation: Sx*. Sy . SHFT 2 (S-VAR) 1 to 3 SHIF 2 (S-VAR) ▶ 1 to 3

Regression Coefficients: A, B, Correlation Coefficient: r Regression Coefficients for Quadratic Regression: A, B, C SHIFT 2 (S-VAR) **▶ ●** 1 to 3

Estimated Values: \hat{x} , \hat{y}

Estimated Values for Quadratic Regression: \hat{x}_1 , \hat{x}_2 , \hat{y} SHFT 2 (S-VAR) (S-VAR)

 \hat{y} and \hat{y} are not variables. They are commands of the type that take an argument immediately before them. See "Calculating Estimated Values" for more information

1 To calculate the mean (\bar{x}) and population standard deviation (σ_x) for the following data: 55, 54, 51, 55, 53, 53, MODE 2 (SD)

55 OT 54 OT 51 OT 55 OT 53 OT OT 54 OT 52 OT 53.375 SHIFT 2 (S-VAR) 1 (\bar{x}) SHIFT 2 (S-VAR) 2 (σ_x) = 1.316956719

To calculate the linear regression and logarithmic regression correlation coefficients (r) for the following paired-variable data and determine the regression formula for the strongest correlation: (x, y) = (20, 3150), (110, 7310),(200, 8800), (290, 9310). Specify Fix 3 (three decimal places) for results

20 • 3150 DT 110 • 7310 DT 200 98800 0 290 9310 0 SHIFT 2 (S-VAR) ▶ 3 (r) ■

MODE 3 (REG) 2 (Log) 20 • 3150 🗊 110 • 7310 🗊 200 7 8800 0 290 7 9310 0 0.998 SHIFT 2 (S-VAR) ((A) (-3857.984

SHIFT 2 (S-VAR) **▶ ≥** (B) **=**

0.923

2357.532

Logarithmic Regression Formula: $y = -3857.984 + 2357.532 \ln x$

■ Calculating Estimated Values

are a large number of data items.

Based on the regression formula obtained by paired-variable statistical calculation, the estimated value of v can be calculated for a given x-value. The corresponding x-value (two values, x_1 and x_2 , in the case of quadratic regression) also can be calculated for a value of y in the regression formula.

<u>//3</u>

To determine the estimate value for x when y = -130 in the regression formula produced by logarithmic regression of the data in **2**. Specify Fix 3 for the result. (Perform the following operation after completing the operations in \mathcal{Q}_2 .)

(\bigcirc 130) SHF 2 (S-VAR) \bigcirc \bigcirc 1 (\hat{x}) \equiv 4.861 Important: Regression coefficient, correlation coefficient, and estimated value calculations can take considerable time when there

16. Equation Calculations (EQN)

The EQN Mode lets you solve equations up to three degrees and simultaneous linear equations with up to three unknowns

- 1. Press WODE MODE 1 (EQN) to enter the EQN Mode.
- 2. On the menu that appears, select an equation type. - ® -

Unknowns? → Degree? 2 3	
To select this calculation type:	Press this key:
Simultaneous linear equations with two unknowns $(a_nx + b_ny = c_n)$	2
Simultaneous linear equations with three unknowns $(a_nx + b_ny + c_nz = d_n)$	3
Quadratic equation (ax² + bx + c = 0)	▶ 2
Cubic equation $(ax^3 + bx^2 + cx + d = 0)$	₽ 3

3. Use the Coefficient Editor that appears to input coefficient values. • To solve $2x^2 + x - 3 = 0$, for example, press () 1 in step 2, and then input the following for the coefficients (a = 2, b = 1, c = -3):

- Any time until you input a value for the final coefficient (c for a quadratic equation, d for a cubic equation), you can use the \triangle and keys to move between coefficients on the screen and make changes, if you want.
- · Note that you cannot input complex numbers for coefficients. Important: The following operations are not supported by the Coefficient Editor: M+, SHIFT M+ (M-), SHIFT RCL (STO). Pol, Rec, and multi-statements also cannot be input with the Coefficient Editor.

4. After all the values are the way you want, press

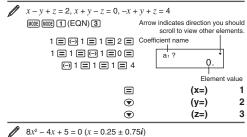
- This will display a solution. Each press of
 will display another solution. Pressing
 while the final solution is displayed will return to the Coefficient Editor.
- You can scroll between the solutions using the 🐨 and 🖎
- To return to the Coefficient Editor while any solution is displayed, press AC.

Note: Values cannot be converted to engineering notation on the solution screen

■ Changing the Current Equation Type Setting

Press [MODE] [1] (EQN) and then select an equation type from the menu that appears. Changing the equation type causes the values of all Coefficient Editor coefficients to change to zero.

■ EQN Mode Calculation Examples



MODE MODE 1 (EQN) (2 8 = -4 = 5 = (x1=)0.25 0.75i SHIFT (Re⇔Im) (x1=)(x2=)0.25 \odot SHFT ■ (Re⇔Im) (x2=)-0.75i

• If a result is a complex number, the real part of the first solution appears first. Press ೯ (Re⇔Im) to toggle the display between the real part and imaginary part of a solution.

17. Calculation Ranges, Number of **Digits, and Precision**

■ Calculation Range and Precision

Number of Digits for Internal Calculation: 15 digits Precision: In general, ±1 at the 10th digit for a single calculation. Precision for exponential display is ±1 at the least significant digit. Errors are cumulative in the case of consecutive calculations

■ Function Calculation Input Ranges and Precision

Input Range

runctions	input range		
sinx cosx	DEG	$0 \le x < 9 \times 10^9$	
	RAD	$0 \le x < 157079632.7$	
	GRA	$0 \le x < 1 \times 10^{10}$	
tanx	DEG	Same as $\sin x$, except when $ x = (2n-1) \times 90$.	
	RAD	Same as $\sin x$, except when $ x = (2n-1) \times \pi/2$.	
	GRA	Same as $\sin x$, except when $ x = (2n-1) \times 100$.	
sin-1x	$0 \le x \le 1$		
$\cos^{-1} X$			
tan-1x	$0 \le x \le 9.999999999 \times 10^{99}$		
sinhx	$0 \le x \le 230.2585092$		
coshx			
sinh-1x	$0 \le x \le 4.9999999999 \times 10^{99}$		
cosh-1x	$1 \le x \le 4.9999999999 \times 10^{99}$		
tanhx	$0 \le x \le 9.999999999 \times 10^{99}$		
tanh-1x	$0 \le x \le 9.999999999 \times 10^{-1}$		
logx/lnx	$0 < x \le 9.999999999 \times 10^{99}$		
10 ^x	$-9.999999999 \times 10^{99} \le x \le 99.99999999$		
e^{x}	-9.999	$9999999 \times 10^{99} \le x \le 230.2585092$	
\sqrt{x}	0 ≦ <i>x</i>	< 1 × 10 ¹⁰⁰	

χ^2	$ x < 1 \times 10^{50}$	
X ⁻¹	$ x < 1 \times 10^{100}; x \neq 0$	
3√X	$ x < 1 \times 10^{100}$	
x!	$0 \le x \le 69$ (x is an integer)	
nPr	$0 \le n < 1 \times 10^{10}, 0 \le r \le n \ (n, r \text{ are integers})$ $1 \le \{n!/(n-r)!\} < 1 \times 10^{100}$	
nCr	$0 \le n < 1 \times 10^{10}, 0 \le r \le n \ (n, r \text{ are integers})$ $1 \le n!/r! < 1 \times 10^{100} \text{ or } 1 \le n!/(n-r)! < 1 \times 10^{100}$	
Pol(x, y)	$ x , y \le 9.999999999 \times 10^{99}$ $\sqrt{x^2 + y^2} \le 9.999999999 \times 10^{99}$	
$\operatorname{Rec}(r, \theta)$	$0 \le r \le 9.999999999 \times 10^{99}$ θ : Same as $\sin x$	
01 11	$ a $, b , c < 1 × 10 ¹⁰⁰ ; 0 \leq b , c The display seconds value is subject to an error of ±1 at the second decimal place.	
01 77	x < 1 × 10 ¹⁰⁰ Decimal ↔ Sexagesimal Conversions 0°0°0° ≤ $ x $ ≤ 9999999°59°	
^(x ^y)	$x > 0$: $-1 \times 10^{100} < y \log x < 100$ x = 0: $y > 0x < 0: y = n, \frac{1}{2n+1} (n is an integer)However: -1 \times 10^{100} < y \log x < 100$	
^x √y	$y > 0$: $x \neq 0$, $-1 \times 10^{100} < 1/x \log y < 100$ y = 0: $x > 0y < 0: x = 2n + 1, \frac{1}{n} (n \neq 0; n \text{ is an integer})However: -1 \times 10^{100} < 1/x \log y < 100$	
a^b/c	Total of integer, numerator, and denominator must be 10 digits or less (including division marks).	
SD (REG)	$\begin{aligned} x &< 1 \times 10^{50}; \ y &< 1 \times 10^{50}; \ n &< 1 \times 10^{100} \\ \sigma_x, \ \sigma_{y_1} \ \bar{x}, \ \bar{y} : n &= 0 \\ s_x, \ s_y, \ A, \ B, \ r : n &= 0, \ 1 \end{aligned}$	
• Precision is beginning the same as that described under "Calculation		

- · Precision is basically the same as that described under "Calculation Range and Precision", above,
- · Calculations that use any of the functions or settings shown below require consecutive internal calculations to be performed, which can cause accumulation of error that occurs with each calculation. $^{\wedge}(x^{y})$, $^{x}\sqrt{y}$, $^{3}\sqrt{}$, x!, n Pr, n Cr; $^{\circ}$, r , g (angle unit: radians); σ_{x} , σ_{x} , regression coefficient.
- Error is cumulative and tends to be large in the vicinity of a function's singular point and inflection point.
- · During statistical calculation, error is cumulative when data values have a large number of digits and the differences between data values is small. Error will be large when data values are greater than six digits

18. Error Messages

The calculator will display an error message whenever an error occurs for any reason during a calculation.

- be positioned at the location where the error occurred, ready for input. Make the necessary corrections to the calculation and execute it again.
- Press AC to return to the calculation screen. Note that this also clears the calculation that contained the error.

Math ERROR

2

Cause: • The intermediate or final result of the calculation you are performing exceeds the allowable calculation range. • Your input exceeds the allowable input range. • The calculation you are performing contains an illegal mathematical operation (such as

Action: • Check the input values and reduce the number of digits. • When using independent memory or a variable as the argument of a function, make sure that the memory or variable value is within the allowable range for the function.

Stack ERROR

Cause: The calculation you are performing has caused the capacity of the numeric stack or the command stack to be exceeded Action: • Simplify the calculation expression. • Try splitting the calculation into two or more parts.

Syntax ERROR

Cause: There is a problem with the format of the calculation you

Action: Make necessary corrections

19. Before Assuming Malfunction of the Calculator...

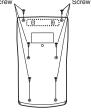
Perform the following steps whenever an error occurs during a calculation or when calculation results are not what you expected. Note that you should make separate copies of important data before performing these steps

- 1. Check the calculation expression to make sure that it does not contain any errors.
- 2. Make sure that you are using the correct mode for the type of calculation you are trying to perform
- 3. If the above steps do not correct your problem, press the (on) key. 4. Initialize all modes and settings. See "Initializing Calculation Mode and Setup".

20. Replacing the Battery

Important: Removing the battery will cause all of the calculator's memory contents to be deleted

- 1. Press SHIFT AC (OFF) to turn off the Screw calculator.
- 2. Remove the cover as shown in the illustration and replace the battery, taking care that its plus (+) and minus (-) ends are facing correctly.
- 3. Replace the cover.
- 4. Initialize the calculator. See "3. Initializing the Calculator"
- Do not skip the above step!



21. Specifications

Power Requirements: AA-size battery R6P (SUM-3) × 1 Approximate Battery Life: 17,000 hours (continuous display of

flashing cursor)

Power Consumption: 0.0001 W Operating Temperature: 0°C to 40°C (32°F to 104°F)

Dimensions: 19.5 (H) × 78 (W) × 155 (D) mm

 $^{3}/_{4}''$ (H) \times $3^{1}/_{16}''$ (W) \times $6^{1}/_{8}''$ (D) Approximate Weight: 130 g (4.6 oz) including battery



Manufacturer: CASIO COMPUTER CO., LTD. 6-2, Hon-machi 1-chome Shibuya-ku, Tokyo 151-8543, Japan Responsible within the European Union:

CASIO EUROPE GmbH Casio-Platz 1 22848 Norderstedt, Germany



This mark applies in EU countries only.

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